

MRAC Hamateur Chatter

The Milwaukee Radio Amateurs Club

November 2016 Volume 24, Issue 11

100 Years, 1917—2017 The oldest Continuous Ham Radio Club in the Midwest



From the President

Happy New Year! We hope that you all had a great holiday season, and are looking forward to all the big things we have planned for 2017!

We are officially in our Centennial Year, and our celebrations and events for the 100th anniversary of the Milwaukee Radio Amateurs' Club are about to be underway. With different public events and gatherings including special event stations being held throughout 2017, we have lots in store, including finalizing the details for our 100th Anniversary Celebration Banquet that will be held on Saturday, October 21, 2017 (so mark your calendars!). As more of the details are firmed up, we will post them on the club website, Yahoo group, and right here on Facebook. You may have already gotten a sneak peek at the Calendar of Events we posted on January 1. We'll have hard copies for everyone at our monthly meetings and upcoming events, so be sure to pick one up.

Plus, a friendly reminder that we will need volunteers to help at all the events we have planned this year, so please consider helping the club make this upcoming year a very special one.

Our first meeting of our centennial year will be held on Thursday, January 26, at 7pm at Redemption Lutheran Church at 4057 Mayfair Road. You won't want to miss this meeting, as our topic is feedlines. PLUS, you will get the FIRST look at our brand new, redesigned MRAC logo!

Finally, a BIG programming note: the 2017 MRAC/MAARS Swapfest has found a new home! Dan N9ASA has worked out a deal for us to use the Elks Lodge on Saturday, April 1. This is the same weekend that the former AES had originally scheduled for Superfest. We are hoping that the draw of HRO and being the same weekend of what would have been Superfest will help with attendance.

With the date change, we will still keep the February 23, 2017 meeting as our Annual Potluck Dinner. This has been a popular event over the last few years, and we hope to see everyone there for this and all the other great activities we have for our centennial celebration!

Thanks,

Dave KA9WXN



MRAC Officers:

Terms Expiring in 2018

- President – Dave, KA9WXN
- V-President– Dan, N9ASA
- Secretary – MBH, KC9CMT
- Treasurer – MBH,,KC9CMT

Terms Expiring in 2017

- Director – Al, KC9IJJ
- Director – Vacant
- Director – Tom, W9TJP
- Director--Dale, AB9DW

The Club Phone Number is: (414) 332-MRAC or

(414) 332- 6 7 2 2

Visit our website at:

www.w9rh.org

Mail correspondence to:

M. R. A. C.

**PO Box 26233
Milwaukee, WI**

53226-0233

Board of directors meeting called to order at 7:05 pm by Dave Shank, KA9WXN club president.

Director's present: Michael KC9CMT, Dave KA9WXN, Al, KC9IJJ, Tom W9TJP by Video conference.

Absent: Dan N9ASA, Dale, AB9DW, one vacancy on the board.

Preliminary Discussion: The Treasurers report for October 2016 was presented by Michael, KC9CMT. The treasurers report was approved as read by KC9CMT, a motion to accept was made by Tom, W9TJP, seconded by Al, KC9IJJ. The October balance ended with \$20,147.40 in Club accounts. New member certificates will be mailed if not handed out when they become available. The PayPal account has been discontinued due to a \$5 inactivity fee being assessed by the Bank.

Meeting Presentations: The January presentation will be conducted by Dave, WB9BWP. February may be our food meeting. Kermit Carlson will be the guest speaker for our March meeting. The April meeting will be our annual election, in addition to a presentation on Radio Astronomy. May 2017 will be the annual club auction. The people from Milwaukee solar energy have said they would be willing to do another presentation to the club. Another good topic is lightening protection. The Ham Radio Outlet retailer is willing to have an "out-of-trunk" swapfest May 20th of 2017, 8-1 pm. The club is considering changing locations for the Board meeting. Somewhere closer to the city, perhaps the HRO store.

Field Day: Field day went well at the MATC facility. MATC has both port-a-potties and hand wash stations at the location. It's a good location, but may not be available in 2017. The board would like to have a working committee for the 2017 field day effort.

Special Project Committees & Committee reports:

Repeater Report: The club would like more than one repeater control operator. A club repeater control operator should be a extra class operator to have the kind of privileges that are necessary to operate field day to its fullest extent.

New Business: The Board will have to decide by the end-of-year where we will be holding our Board meetings for 2017. Dave, KA9WXN is continuing discussions regarding events for the club's 2017 100th anniversary. Tom, W9TJP reports that Ham Radio Outlet is open from 10am-5:30pm, Monday through Saturday. Locations and dates are still being discussed as to the 100th anniversary Banquet. The banquet would have to be catered. Kermit Carlson will be the featured speaker at the banquet, tentative date October 21st, 2017. **February 5th, 2017** will be the day of the FM Simplex contest, 100 bonus points will be given out to each station that works the club call W9RH/100. Dave, KA9WXN seems to have added this project to his enormous list of time requirements.

We need to start planning special event stations for the entire year of 2017. Dave, KA9WXN will attempt to generate interest among the membership in forming a committee to handle planning. Dan, N9ASA has arranged with The House of Harley Davidson to have a special event station during their annual bash on June 17th, 2017. MakersFaire 2017 will be a special event station from the State Fair Park. The board does want to go ahead with planning a banquet during the 100th anniversary year. Time and place to be determined. JOTA coordinator, KC9WW, Fred is helping the club to format an event at the Indian mounds, in Oconomowoc.

Swapfest Committee: The club is looking at April 1st as the new MRAC/MAARS swapfest date. The club has a tentative booking for the Elks lodge. The Elks club is a smaller venue, but will hold as many tables. We expect about 38 tables to be rented to vendors. A May out-of-trunk event at HRO is a possibility, May 21st being the date. The idea was forwarded to move the Swapfest to April 1st, as a guard against losses due to inclement weather. Name suggestion: "Spring Fling". 2017 will be our 7th annual swapfest.

Special Projects: A special event station will be June 1st, at Greenfield House of Harley dealership. The special event will run during the dealerships hours of operations. The club needs someone to take over the FM simplex contest for February of 2018. The club really needs PR and recruitment, business cards have been printed and will be handed out at all club activities. The board of director' has set a tentative date of October 21st, 2017 for the MRAC 100th anniversary banquet, to be catered for a crowd of 200. The club could send out invitations for the banquet. An August 19th lighthouse event is being worked on. A special event station at the lakefront is being worked on by Dave, KA9WXN. The club will be sending letters to former members asking if they would like to renew for 2017, our 100th anniversary year. This will allow our past members to take part in all the activities being planned. Dave, WB9BWP wants to send anniversary information to Gordon West for his weekly Ham Nation Broadcast.

A special event station at the War Memorial is being discussed. The club will use the club call of W9RH/100 for all our special events. The club would also like to have a membership drive for new members for 2017. There would be a special certificate for any new members of the club. The club needs to have some special QSL cards, or ridged certificates printed up for contacts during the calendar year of 2017. The club would like to query members about working on projects for the 100th anniversary. MakersFaire is on September 23-24th, 2017. JOTA 2017 will be another event the MRAC will be involved in. The club will be putting together a go kit for taking to various events.

Website update: The club has a Wiki page. Dave, KA9WXN has been working on an 100th anniversary page.

Clubs throughout the country need to use the spectrum that they have been given. The 220mhz band is not used very often in the Milwaukee area. DMR is now becoming a item among Hams'. A Club calendar is a project that the Board of Directors' would like to pursue. Dave, KA9WXN has been working on this idea. A schedule of upcoming events should be printed in the chatter each month.

A motion was made to adjourn the meeting at 8:45 pm by Al, KC9IJJ, seconded by Michael, KC9CMT. Meeting adjourned at 8:50 pm.

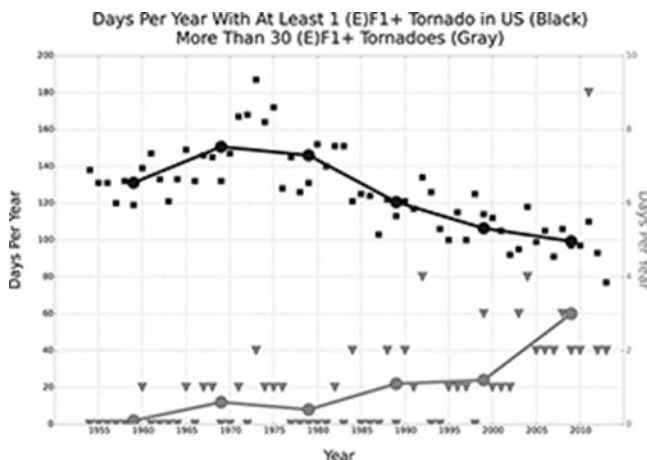


'Second Tornado Season' Is Underway

Spring is not the only season that features a significant number of severe thunderstorms and tornadoes. There is an uptick in severe thunderstorms and tornadoes from late October through February (second severe season). There have been some notable tornado outbreaks during the second season. Spring is known for its severe thunderstorms that can produce violent tornadoes. However, it's not the only season known for tornadoes. Autumn through Winter is considered the "second" tornado season.

"The second half of October, and especially November, can often be a second season for tornadoes and severe thunderstorms," said tornado expert Dr. Greg Forbes. "In many ways, this is the counterpart to spring, when strong fronts and upper-air systems march across the United States. When enough warm, moist air accompanies these weather systems, the unstable conditions yield severe thunderstorms and sometimes tornadoes."

While there isn't a long-term trend in the number of U.S. tornadoes stronger than EF0, several recent studies suggest the time distribution of those tornadoes and their tendency to cluster in outbreaks may be changing.



(EF1) Tornado Days and Active Tornado Days

Number of days each year with at least one (E)F1 tornado (black squares) and more than 30 (E)F1 tornadoes (gray triangles) from 1954-2013. Average over each decade indicated by large dots and line plots. (Brooks et al. 2014)

Fewer Tornado Days, But More Active Days

When eliminating (E)F0 tornadoes from yearly counts, which have steadily risen over the past few decades due to more extensive spotter networks, the implementation of Doppler radar, and advanced technology such as smartphones and social media, there is essentially no long-term yearly trend in the raw number of (E)F1 and stronger tornadoes. However, the number of days with at least one (E)F1+ tornado in the U.S. has fallen from an average of 150 such days in the early 1970s to around 100 days in the first decade of the 21st century, according to an October 2014 study in the journal *Science*.

However, the study by noted tornado researchers Dr. Harold Brooks of the National Severe Storms Laboratory, Greg Carbin of NOAA's Storm Prediction Center, and Dr. Patrick Marsh, also of NOAA/SPC, found the number of days with a large number of tornadoes is actually increasing over time.

"The frequency of days with more than 30 (E)F1+ (tornadoes) has increased from 0.5 to 1 days per year in the 1960s and 1970s to 3 days per year over the past decade," says the Brooks et al. study.

In essence, we have fewer days with tornadoes, but are packing more of them into the days we have. "Approximately 20 percent of the annual tornadoes in the most recent decade have occurred on the three biggest days of each year," says the Brooks et al. study.

Another recent study by Dr. James Elsner not only found a similar clustering of tornadoes into fewer days, but also a spatial clustering of tornadoes on those very active days. "It appears that the risk of big tornado days with densely concentrated clusters of tornadoes is increasing," Elsner says in the July 2014 study.



Twin tornadoes photographed near Pilger, Nebraska on June 16, 2014. (Silver Lining Tours)

Large Swings in Monthly, Yearly Numbers

For only the second time since 1950, the first three weeks of March 2015 passed without a single tornado anywhere in the U.S.

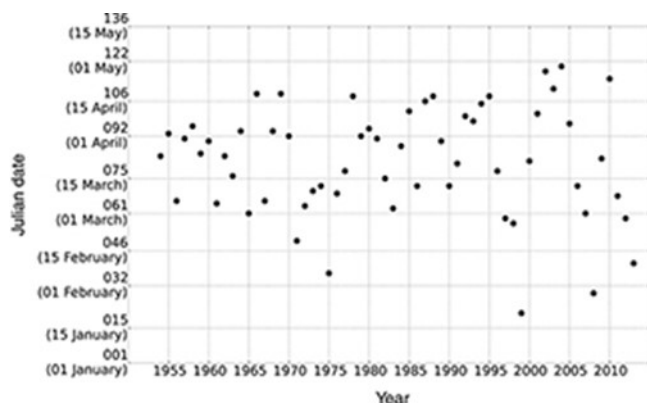
Yet as recently as 2011, almost 1,700 tornadoes ripped across the nation, including 349 tornadoes in a four-day outbreak from April 25-28, the costliest tornado outbreak in U.S. history.

While year-to-year variability has long been prevalent in U.S. tornado counts, a 2014 study by Dr. Michael Tippet found volatility, a term he uses for variability in tornado counts, has increased since 2000.

Furthermore, the Brooks et al. study found the tendency for more monthly extreme highs and lows in (E)F1+ tornado counts in recent years.

"Excluding the zero-tornado months, there are more extreme months in the most recent 15 years of the database (1999-2013) than in the first 45 years," says Brooks et al. 2014. In other words, we've seen extreme high monthly tornado counts (758 tornadoes in April 2011, for example) and extreme low monthly tornado counts (March 2015, for example) more often over the past 15 years, a trend that may continue.

Of course, low tornado count years do not preclude significant tornadoes or tornado outbreaks. Despite the lowest three-year tornado count on record from 2012-2014, we still had destructive outbreaks in March 2012, in May 2013 (Moore and El Reno, Oklahoma), and April 2014 (Vilonia, Arkansas).



When Tornado Season Shifts Into Gear

Julian date of the 50th (E)F1+ U.S. tornado each year from 1954-2013. (Brooks, et al. 2014)

Skewing Earlier in the Year

Tornadoes can occur any time of year the overlap of sufficient moisture, atmospheric instability -- relatively cold, dry air aloft overlying warm, humid air near the Earth's surface -- and a strong source of lift such as a warm front, dryline, strong jet-stream disturbance occur.

Because of that, it's difficult to define a tornado season on a national scale as distinctly as, say, a hurricane season. However, Brooks et al. tracked as a metric the occurrence of the year's 50th EF1+ tornado to get a sense of whether the timing of the ramp-up in U.S. tornadoes typically seen in spring is changing.

While the long-term average date (March 22) hasn't changed, Brooks et al. found a marked increase in the number of "late-start" and "early-start" years since the late 1990s. The four latest starts and five of the ten earliest starts to the season all occurred in the 1999-2013 period. These range from late January (1999 and 2008) to late April (2002, 2003, 2004 and 2010).

In essence, even the date the season kicks into a higher gear is becoming more volatile.

Climate Change Role?

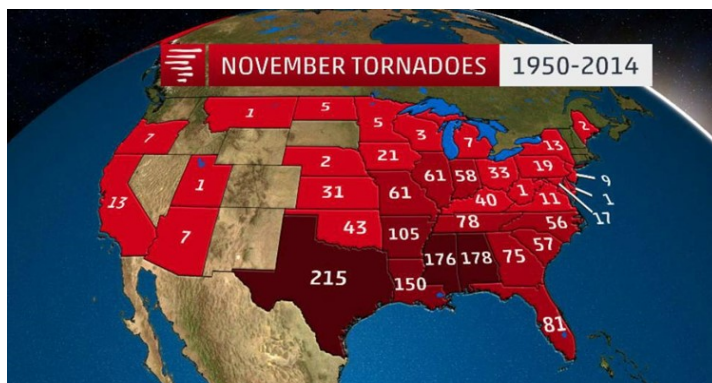
Now, the toughest question: Is climate change playing a role in the increasing variability of the nation's tornadoes? The short answer is, possibly.

The challenge in answering this question is linking short-fuse events like tornadoes and tornado outbreaks to long-term changes in atmospheric parameters generally conducive for severe thunderstorms, such as instability and wind shear.

Studies by Dr. Jeff Trapp and Dr. Noah Diffenbaugh, among others, suggest atmospheric instability, driven by increased moisture, is expected to be greater in a warming climate. However, wind shear, crucial for the formation of supercells which can produce the strongest tornadoes, may diminish overall, but may feature more days with higher wind shear. Therefore, the overall environment may be more conducive for severe thunderstorms (with large hail and damaging winds), but it remains unclear whether the number of tornadoes or even strong tornadoes would necessarily rise in a warming world.

This brings up an interesting possibility, a seasonal outlook for severe weather, similar to hurricane season outlooks. "I suspect that ultimately knowing if a severe weather season will be above, below, or near normal would be important for reinsurance portfolios as an increasing amount of money is spent on hail and wind claims," said Dr. Patrick Marsh from NOAA/SPC.

Second Season: November through February



While most of the largest tornado outbreaks still occur in spring, autumn has its share of storms as well. Dr. Forbes examined the storm statistics and found six of the largest 55 known tornado outbreaks occurred in October and November. May is still the peak month for tornadoes. Up to 52 percent of September's tornado outbreaks are due to landfalling tropical storms and hurricanes.

October and November's tornadoes are caused by upper-level troughs (dips in the jet stream) and cold fronts affecting the South and sometimes the Midwest.

The map above shows how many tornadoes have been confirmed by the National Weather Service during the month of November from 1950-2014. Texas has the most, but when adjusted for total area, Mississippi has the most, followed closely by Louisiana and Alabama.

As the map suggests, second-season tornado outbreaks are most common in the Gulf Coast states, where temperature and humidity levels tend to be higher. They can sometimes spread north to the Ohio Valley and southern Great Lakes. On rare occasions, weak tornadoes can form on the West Coast in November.

Greatest Second-Season Tornado Outbreak: Nov. 21-23, 1992 - 105 Tornadoes

- States affected: 13 total, from Texas to the Carolinas.
- 26 people were killed and 638 were injured.
- The outbreak caused \$713 million in damage; the Houston area was hit especially hard.
- It was rated a top-five worst tornado outbreak in month since 1950 by Dr. Forbes.



White Plains, Georgia, was practically leveled by an F4 tornado on November 22, 1992. (John Bazemore/AP)

This outbreak started the Saturday before Thanksgiving 1992 in Houston. An incredible seven tornadoes were spawned in the span of just two hours in the metro area, with three twisters on the ground at one particular time in Harris County. The strongest tornado, rated F4, destroyed more than 200 homes on Houston's east side. This was the strongest tornado to hit the Houston metro since 1950.

Another F4 tornado went on a 128-mile-long rampage through Mississippi overnight Saturday into Sunday morning, Nov. 22. The storm claimed 12 lives and damaged or destroyed more than 700 homes.

Fifteen tornadoes touched down in Indiana that Sunday, the largest November outbreak in state records. One tornado was an F4 in southeast Indiana and northern Kentucky. Not to be left out, other F4 tornadoes carved a swath through the far northwest suburbs of Atlanta, and also struck near White Plains and Lake Oconee, Georgia.

Finally, a pair of F3 tornadoes in North Carolina killed two and injured 59.

There seems to be a misconception that leads some to believe that good antennas, at a suitable height, aren't necessary on 160 meters. In fact, the opposite is true! This is because 160 meters is generally a noisy band - more so than the 3.5-MHz and higher bands. This is a result of the vigorous atmospheric noise we must deal with, along with greater man-made noise. You can add to this hodgepodge the presence of TV "birdies" (15.75-kHz or 15.625-kHz horizontal-oscillator harmonic radiation) that can virtually wipe out reception if the other station is weak. (TV birdies are seldom a problem above 3.5 MHz.) It is prudent to locate your 160-meter antenna as far from your TV antenna as possible. A brute-force ac-line filter on your TV receiver helps keep TV-birdie harmonics from radiating via the ac line in your home, and via those conductors outside your house.

The matter of height

We hams tend to think of height in terms of physical feet or meters, rather than with regard to wavelengths or fractions thereof above earth ground. Whereas a height of 50-60 feet may seem high above ground, it's very low in terms of wavelength at the lower frequencies. An ideal horizontal antenna height for working distant stations is $\frac{1}{2} \lambda$ or greater above ground. This is relatively easy to achieve on, say, 20 meters (35 feet). But, for 3.5 MHz it is 141 feet, and at 1.8 MHz we need to have this ideal antenna 273 feet above ground! Not practical for most of us.

By way of example, a 160-meter dipole that is 35 feet above ground is equivalent, in terms of wavelength height, to a 10-meter dipole at about 2 feet above ground. None of us would consider erecting a 10-meter beam at 2 feet above ground!

What happens at low height?

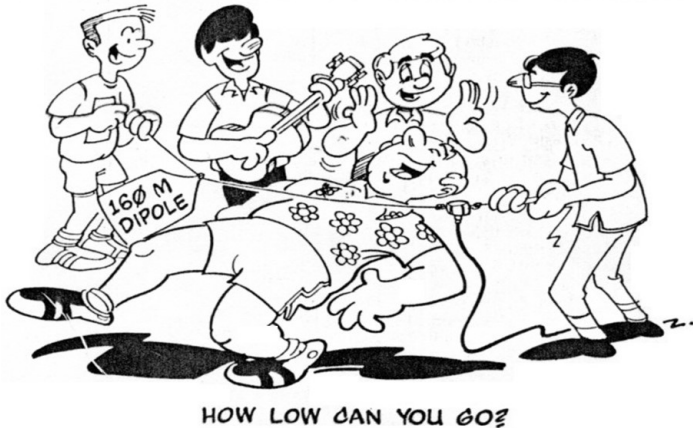
We can expect dreadful antenna efficiency when we use a 160-meter horizontal antenna at typical ham-antenna heights. Ground losses become high and the antenna has no directivity. In fact, the radiation is pretty much straight up, in the shape of a sphere. This can actually be very good for short-range QSOs at night, out to some 600 miles. Inverted-V antennas do somewhat better because they have a vertically polarized component (if the enclosed angle is between 90 and 110 degrees). They also have an omnidirectional radiation pattern. I prefer a 160-meter inverted V to a horizontal dipole at heights less than 100 feet. The feed impedance of a dipole at low height will be affected; a matching network at the antenna feed point may be required if you use coaxial cable for your transmission line. A dipole that is $\frac{1}{2} \lambda$ high has a characteristic feed impedance of 75 ohms. This isn't so at other heights (for details, see The ARRL Antenna Book).

An answer for the urban dweller

Most hams who live in metropolitan areas do not have sufficient property to erect a full-size 160-meter horizontal dipole. In fact, the urbanite may have difficulty accommodating a 160-meter inverted V. An old expression is, "If you can't go out, go up." Vertical antennas for top band are popular and practical. A full-size $\frac{1}{4} \lambda$ vertical for 1.9 MHz is 123 feet high. Not many hams are willing to go to that extreme, especially in the city! You can, however, erect a short vertical antenna with some form of top loading (coil and capacitance hat near the upper end). If you have a tower, you may elect to shunt feed it (with your HF beam antenna in place) and add some top loading. W1FB's Antenna Notebook and The ARRL Antenna Book describe methods for doing this.

A popular and effective antenna for 160 meters is the inverted L. It works well for local and DX communications if a ground-radial system is used with it. In fact, all $\frac{1}{4} \lambda$ antennas fed against ground require a radial system if losses are to be kept low. A couple of metal rods driven into the soil will not take the place of a radial system. Beware of this.

The Experimenters' Bench



If you're not getting the top-band results you expected, you'll find these antenna tips of use.

It is always a pleasure to welcome newcomers to the "gentlemen's band," as 160 meters has been called for many years. But few have signals that rattle the walls in my shack. In fact, they are often barely readable, or at best an S unit or so above the noise threshold.

When first-timers give me a call to ask for a signal check, I always inquire about their antenna. "I'm using my 35-foot-high 75-meter dipole with a Transmatch" is one common response. Another is, "Antenna here is a 100-foot, end-fed wire about 15 feet above ground." When I hear 160-meter antenna descriptions of this type I say "ouch!" The majority of these newcomers are using barefoot transceivers, which at times must look into high values of SWR.

approach to an antenna ground. If the rods are at least 8 feet long and driven into the soil, however, the rods will provide a dc ground for your antenna and station

An inverted-L antenna consists of $\frac{1}{4} \lambda$ of wire, shaped like an upside-down L (Fig 1). The greater the length of the vertical portion of the wire, the better the antenna will perform. The horizontal portion carries less current and does less radiating. So, the antenna radiation is predominantly vertical in polarization. This antenna has a fairly low radiation angle (typically $20\text{--}35^\circ$ which makes it useful for all-around communications. A number of hams have earned their 160-meter DXCC while using simple inverted-L antennas.

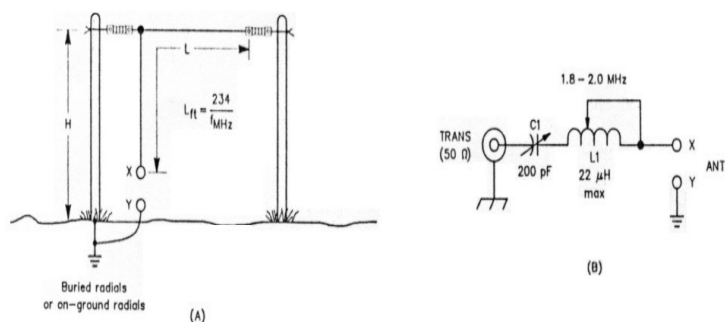


Fig 1 - Example of a $\frac{1}{4}\text{-}\lambda$ inverted-L antenna. Dimension H should be as high as practicable for best performance. The support poles may be metal or wood, or they can be trees. Illustration B shows a simple matching network that works very well with inverted-L antennas. The capacitor can be motor-driven from the ham shack to provide a 1:1 SWR across the band. A single value of inductance normally permits full band coverage with C1. Once the tap is selected, no further adjustments are required for full 160-meter coverage.

The major trade-off with verticals is that they pick up far more noise than do horizontal antennas. This is because most man-made noise is vertically polarized. Also, you may find that you have a "dead zone" with your vertical antenna. There will be times when signals out to a couple of hundred miles are very weak. Your signal will also be weak at the other ham's location, since it is skipping over his area. This does not always happen; it depends on propagation conditions at a given time.

Short verticals (30 feet long or greater) can be effective, too. You may want to make one from aluminum tubing or a telescoping steel mast. The shorter the vertical, the lower the antenna efficiency - unless you add many more radials to your ground system. Likewise as you add more inductive loading. But a short loaded vertical is often more effective for working distant stations than a full-size horizontal antenna near ground. I had good luck when I lived in Detroit during the 1950s while using a 16-foot helically wound vertical antenna on 160 meters. It was wound uniformly with $\frac{1}{2} \lambda$ of no. 14 insulated wire. A 16-foot wooden hand rail from the lumberyard served as the coil form after I applied two coats of spar varnish. An aluminum pie plate was used at the tip of the helix to provide top capacitance and to prevent corona discharge (resulting from the extremely high voltage at the antenna's end) during transmit periods. One-half λ of wire results in $\frac{1}{4}\text{-}\lambda$ resonance (approximately) when winding helical antennas of this type.

The ground system

Some amateurs rebel at the thought of deploying a ground-radial system. Sure, it takes a bit of time and effort, but the reward is well worth the hours you invest in the project. You may hear that it is necessary to use 120 radials that are each $\frac{1}{4} \lambda$ long. Although such a ground system would be nice to

your work, simply route the radials around the house. If there is not enough space for $\frac{1}{4} \lambda$ radials, make them as long as you can. I used a 55-foot top-loaded vertical when lived in Connecticut. I had 20 in-ground radials of mixed wire gauge. Some were only 40 feet long, while others were greater than 100 feet long. I worked all 50 states on 160 meters and confirmed 72 countries with this system while running 100 watts on CW.

Don't worry about ruining your lawn with buried radials. A lawn-edging tool can be used to cut the slits for the wire. The lawn will heal in a month or two, and no one will know about the copper screen you have under the grass!

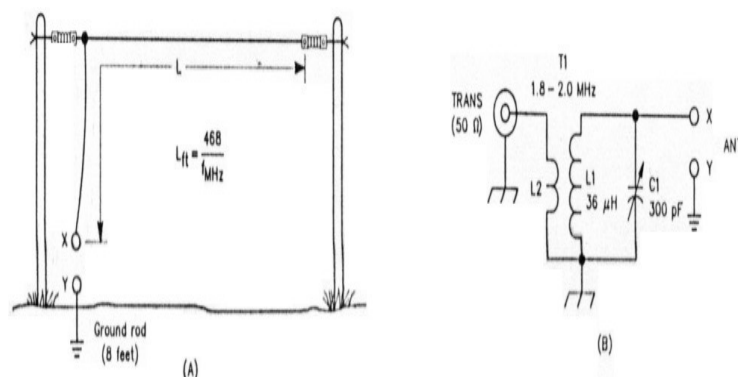


Fig 2 - A $\frac{1}{2}\text{-}\lambda$ version of the antenna in Fig 1. This antenna is similar to one used at W4ZCB. L1 may have a relay-selected tap to permit operation on 80 meters as well. L1 and C1 are outside the house at the antenna feed point in a weather-proof box. C1 is motor driven and should have wide spacing or be a vacuum variable capacitor. Illustration B shows a suitable matching network.

Other 160-meter antennas

Some amateurs obtain good performance with end-fed $\frac{1}{2}\text{-}\lambda$ wire antennas. Results depend on the height of the wire above ground. An antenna erected over poor ground (deep shale, granite or desert sand) may appear to be many feet higher over ground than it is. W4ZCB is situated on a small mountain in North Carolina. His end-fed wire for 160 meters (Fig 2) is only 50-60 feet above the surface of the earth. His signal in Michigan is always very loud. I expect that there's a lot of rock below his property. His antenna is tuned remotely and works equally well on 75 meters (1λ overall).

I use a full- λ horizontal loop for 1.9 MHz. The corners arc only 50 feet above ground, but I live over very dry, sandy soil. I suspect that the virtual (or effective) antenna height is considerably greater than 50 feet. I feed this loop at one corner with 450-ohm ladder line. It works exceptionally well on all of the bands from 160 through 10 meters with the help of a 4:1 balun transformer and my Transmatch. Loops are inherently quiet receiving antennas. My noise level is often S0 to S1, whereas the reading was generally S3 to S6 when I was using an inverted L. Lee, K8CLI, in Loveland, Ohio also uses a full- λ horizontal 160-meter loop at approximately 50 feet. His signal is always among the loudest I hear on 1.9 MHz

Summary remarks

I can't stress strongly enough that we need to take our 160-meter antennas seriously if we are to enjoy the benefits of this wonderful band. A hunk of wire a few feet above ground will surely deprive you of the fun that awaits you on 160 meters. If the other guy has to struggle to copy your signal he may choose to sign off with you. A little thought and effort are required when you erect your first top-band antenna.

Don't settle for mediocrity - it's better to apply the same tender loving care you do when erecting an antenna for 40 or 20 meters. Although I do not advocate using amplifiers when they aren't needed, I suggest that you consider acquiring one for your 160-meter work if you intend to chase DX and have a consistently good signal. Amplifiers provide those extra decibels that are often needed to break through the noise. They are a definite asset when band conditions are poor, which is not atypical on 160 meters.

Finally, every decibel is important. I urge you to make an effort to match your feed line to your 160-meter antenna and to match your end-fed wire to the transmitter.

W1FB, Doug DeMaw

Early Radio: Military Communications

Convoy Ambush on Highway 1 by John Albright

When the 11th Armored Cavalry-the "Blackhorse Regiment"-arrived in the Republic of Vietnam in September 1966, the threat of ambush hung over every highway in the country. Since the regiment's three squadrons each had a company of main battle tanks, three armored cavalry troops, and a howitzer battery, the Blackhorse was well suited for meeting the challenge.

Each of the cavalry troop's three platoons had nine armored cavalry assault vehicles (ACAV's). The ACAV was an M113 armored personnel carrier modified for service in Vietnam and particularly adapted to convoy escort. With the M113's usual complement of one .50-caliber machine gun augmented by two M60 machine guns, all protected by armored gun shields, and with one of its five-man crew armed with a 40-mm. grenade launcher, the vehicle took on some of the characteristics of a light tank. Fast, the track-laying ACAV could keep pace with wheeled vehicles and also deliver withering fire.

Aware that convoy escort would be a primary mission of the 11th Cavalry, the regiment's leaders had concentrated in the five months between alert and departure for Vietnam on practicing counter ambush techniques. In countless mock ambushes, the cavalrymen learned to react swiftly with fire. The first object was to run thin-skinned vehicles out of the killing zone; the armored escorts would then return to roll up the enemy's flanks, blasting with every weapon and crushing the enemy beneath their tracks.

In mid-October, a month after arriving at a staging area at Long Binh, a few kilometers northeast of Saigon, the regiment issued its first major operational order. The Blackhorse was to establish a regimental base camp on more than a square mile of ground along Interprovincial Highway 2, twelve kilometers south of the provincial capital of Xuan Loc. ([See Map #1](#))



ARMORED CAVALRY ASSAULT VEHICLE

Even as the tanks and ACAV's entered and cleared the site for the base, leaflets were dropped from helicopters onto nearby hamlets to alert villagers that the Blackhorse soldiers had come to stay. As the days passed, convoy after convoy rumbled through Xuan Loc on National Highway 1, then south on Highway 2 and on to the developing base camp. Always escorted by ACAV's, the convoys kept this stretch of National 1 open to a degree unknown since the beginning of the Viet Cong insurgency.

While work on the base camp continued, two of the 11th Cavalry's three squadrons were called far afield to assist in other operations. Since the remaining squadron was engaged in searching and clearing surrounding jungles, only company-size units remained to provide perimeter security for the camp. By mid-November the developing base, fat with military supplies of all kinds, had become an inviting target, lightly defended and still only lightly fortified.

Intelligence reports in early November indicated that the 5th Viet Cong Division, which had been fighting to dominate the Xuan Loc area and close Highway 1, was assuming the offensive. When word came that enemy troops had left their usual hideout south of Xuan Loc and were headed in the direction of the base camp, the 11th Cavalry's commander, Col. William W. Cobb, asked for the return of one of his detached squadrons. The request granted, the 1st Squadron began arriving at Long Binh in late afternoon of 20 November on the first leg of a move to the base camp.

Although the howitzer battery and Troop A moved on immediately to augment defenders of the base camp, the rest of the squadron paused overnight at Long Binh to "top off" with fuel and "pull maintenance." These men would leave early the next morning, after a convoy taking along staff sections, clerks, cooks, medics, and other support troops from regimental headquarters had arrived at the camp.

As night fell on 20 November, the two forces that would fight the next day drew closer together. The last vehicles of the 1st Squadron closed at Long Binh in a heavy rain, their crews tired from a 12-hour road march at the end of almost two weeks in the field. Rain continued to pour while the support troops loaded supplies and equipment into the trucks that were to join the convoy the next morning. At the same time, the monsoon that drenched the troopers of the Blackhorse pelted the two battalions and headquarters of the 5th Viet Cong Division's 274th Regiment-the battle-hardened Dong Nai Regiment-as they moved into ambush positions along National Highway 1, west of Xuan Loc.

Midway between the provincial capitals of Bien Hoa and Xuan Loc, Highway 1 dropped sharply to a stream bed and then rose to a gently rolling plateau. A dirt road running north and south intersected National Highway 1 at this point. Low hills rising only 10 to 20 meters above the road level began about 180 meters from the highway on both sides.

On the north side of the highway, grass high enough to hide a standing man covered the ground. Rising like an island in the sea of grass was an expanse of jungle 1,000 meters square, beginning at the north-south dirt road and running parallel to Highway 1, 300 meters north of the edge of the highway.

Along the south side of the highway a wall of jungle had grown up around the trees of an old rubber plantation stretching from the province boundary east for 1,000 meters and ending abruptly at a banana grove. The banana grove lined the south side of the highway for 300 meters before it gave way to an open area ending at the hamlet of Ap Hung Nghia.

Because the jungle and banana grove offered concealment for approach and withdrawal, the commander of the Viet Cong 274th Regiment placed his main force of over a thousand men on the south side of the road, camouflaged and ready to fire automatic weapons and antitank rockets point-blank onto the highway. The ambush extended from just inside the west end of the jungle to the outskirts of Ap Hung Nghia, a distance of 1,500 meters. To handle any U.S. troops who might dismount and take refuge on the north side of the road, the Viet Cong commander deployed infantrymen alone or in groups of two or three across the highway in the tall grass. ([Map 5](#))

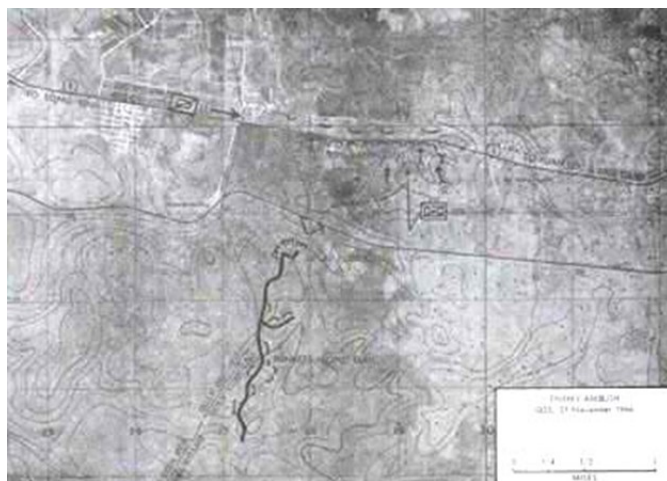
In the classic manner of Viet Cong ambush forces, heavy weapons marked both ends of the killing zone. A 75-mm. recoilless rifle, positioned less than fifteen feet from the road, marked the beginning of the killing zone, just twenty feet inside the west end of the jungle close by the banana grove. A second 75-mm. recoilless rifle dominated the road in the eastern half of the killing zone from the forward slope of a slight hill just to the east of the banana grove. A 57-mm. recoilless rifle farther up the hill, three hundred meters to the east, and an 82-mm. mortar deep in the jungle were to provide supporting fire. Heavy machine guns hidden in huts scattered through the killing zone were to engage American helicopters and jets. Regimental headquarters operated on the crest of a hill five hundred meters west of Ap Hung Nghia, overlooking the entire section of road in the killing zone.

Once the ambush was executed the 274th Regiment was to withdraw to railroad tracks parallel to and a thousand meters south of the highway, then along a trail leading due south under a heavy canopy of jungle. Bunkers along the trail for a distance of two kilometers would provide cover against air attack, while bunkers at the beginning of the trail and a hundred meters south of the railroad tracks would provide defensive positions for a delaying force.

Through the wet chilly night of 20 November, men of the Dong Nai Regiment waited in their concealed positions. At Long Binh loading of the convoy continued well into the night. Tents housing staff sections were struck, folded, and loaded dripping wet into the waiting trucks. Some drivers then put their trucks in line along the road near the convoy's starting point in the hope of being near the front of the column where they could avoid at least some of the grime and exhaust fumes that would plague others farther to the rear. By 0600 most of the trucks waited at the starting point,

though stragglers and latecomers in a variety of vehicles continued to join the column until almost 0700, the announced starting time. Yet 0700 passed and still the escorts had not arrived; one of those inexplicable waits that always seem to haunt units on the move now set in. After a while support units and staff sections that had assumed they could not be ready to leave with the morning convoy saw their chance. They quickly finished loading and lined up their vehicles at the rear of the column. A long column grew longer. Five-ton trucks carrying document-filled CONEX containers (steel cargo transporters), S and P's (stake and platform trucks) loaded with small prefabricated buildings and supplies, jeeps and their trailers, 34-ton trucks, 214-ton "deuce and a half's," and even two large ordnance vans loaded with post exchange supplies and the regiment's finance records, a most precious cargo, joined the column.

Word filtered down through the convoy that the column would roll at eight, then at nine. But not until 0840 was the convoy escort commander designated-1st Lt. Neil L. Keltner, commanding the 1st Platoon, Troop C, of the 1st Squadron.



Map 1



HOISTING CONEX CONTAINER FOR CONVOY LOADING

Keltner quickly gathered the vehicles for his escort, four ACAV's from his platoon and four from Troop C's 2d Platoon. He found, sandwiched among the trucks, an ACAV from Troop A that had missed that troop's move the preceding day. This ACAV-numbered A34-he quickly integrated into his escort force.

He might need this additional armor and more, Keltner mused, for with the help of Capt. Robert Smith, the forward air controller who was circling above the ever-lengthening line, Keltner estimated that the convoy now consisted of over eighty vehicles "of about every size and shape in the U.S. Army inventory."

For the march, Keltner placed his ACAV's in pairs: a pair at the head and rear of the column and at two points equidistant within the column. He added his own vehicle to the two-one of them was the A34 from Troop A-that were some twenty trucks behind the head of the convoy.

At 0920 Lieutenant Keltner gave the signal: "Move out." Rising from the grass along the road where they had been dozing, truckers and their passengers donned flak jackets, put on helmets, picked up their weapons, and mounted their vehicles.

Engines came to life all along the line and the convoy began to roll. After traveling less than a mile, the lead vehicle turned onto National Highway 1 and passed through the village of Ho Nai. The men aboard could not know it but at this point a Viet Cong observation post somewhere in Ho Nai flashed word to the 274th Regiment that the convoy was on the way.

Haphazardly formed, lacking unit integrity, the convoy was by its very nature difficult to protect. Great gaps within the column began to develop early as lightly laden vehicles pulled far ahead of heavily loaded trucks. Accordion-like, the line stretched.

The convoy had been on the road less than forty-five minutes when a noncommissioned officer, M. Sgt. Joseph Smolenski, at the 11th Cavalry's tactical operational center, received an intelligence message in the form of a code word and a location. Instantly recognizing the code word as one the intelligence staff had been told to watch for, he rushed the communication to Maj. Grail L. Brookshire, the regimental S-2. Brookshire realized at once that the message indicated the presence of the headquarters of the 274th Regiment, the best combat unit in the 5th Viet Cong Division. As revealed by the co-ordinates, the enemy location was fifteen kilometers west of Xuan Loc, along Highway I and near Ap Hung Nghia. Confirming that a convoy was on the road, the S-2 saw the position of the enemy troops for what it was—an ambush.

Only a minute passed after receipt of the message before the S-2 radioed a warning of the enemy location to the 1st Squadron's operations center at Long Binh. At the same time the assistant S-3, Capt. Harlen E. Gray, ordered the Blackhorse light fire team (two armed Huey helicopters) aloft to cover the convoy. With a "Witco" received from Blackhorse flight operations on the order, Captain Gray alerted the 1st Squadron on the regimental command net, re-enforcing the warning of a minute before on the intelligence net and using the 2d Squadron, located five kilometers nearer to the 1st Squadron's operations center, as a relay station.

While commanders and duty officers at the two headquarters frantically worked to protect the convoy, the object of their concern continued to rumble eastward toward Xuan Loc, with the forward air controller circling overhead. No warning had yet been sent to the convoy commander. Lieutenant Keltner's major concern remained the accordion-like motion of the convoy and the large gaps that constantly appeared in the column.

Dodging 55-gallon drums placed in the road to slow traffic, the lead trucks rolled through a Vietnamese National Police checkpoint midway between Bien Hoa and Xuan Loc, the men on the trucks waving to the policemen. Lieutenant Keltner's ACAV in the second group of escort vehicles was within a thousand meters of the ambush site when his radio crackled with a message from 1st Squadron headquarters.

"Suspected enemy activity at coordinates 289098."

It was a routine enough message, delivered in a matter-of-fact manner. The lieutenant asked for more information. Squadron headquarters had none. Keltner had received similar messages before and the enemy each time had failed to show up. He was not particularly worried about this one, but he immediately radioed the air controller to verify the location of the front of the column and the relation of the lead vehicles to the suspected enemy position.

Two controllers were by this time circling overhead; since Captain Smith's fuel was low, Maj. Mario J. Stefanelli had arrived to relieve him. Both officers already were alert to the possible enemy activity, for less than two minutes before Keltner received the message from his squadron Captain Smith had received a coded message from the 11th Cavalry operations center with the same information. As Smith finished copying the message, Major Stefanelli assumed air controller responsibility for the convoy, allowing Smith to decode the co-ordinates undisturbed. Smith still had enough fuel to stay overhead a few minutes longer. He was just finishing his decoding when Keltner's call reached Major Stefanelli. The head of the convoy, Stefanelli answered, had just passed the suspected enemy location.

Keltner quickly radioed his ACAV's to warn them of the imminent danger. All but the lead ACAV-C22 answered. A few seconds later C22 reported receiving fire from small arms and automatic weapons and asked permission to return fire. Even as Keltner gave the permission, his own vehicle came alongside the edge of the banana grove that lay south of the highway, and Keltner informed squadron headquarters that the convoy was under fire. It was 1025.

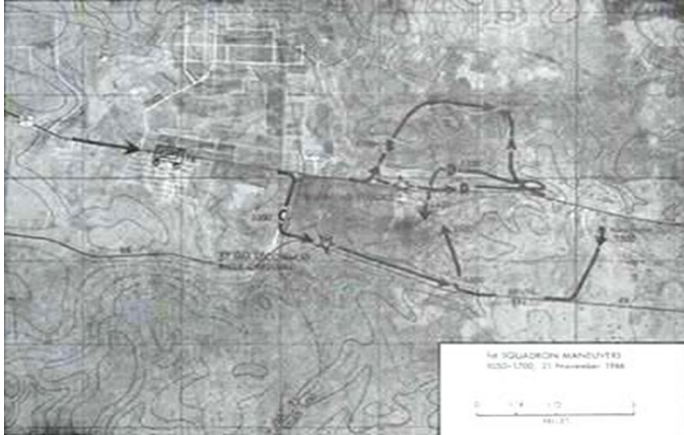
Reacting to earlier counter ambush training, Lieutenant Keltner decided to run the column through the small arms fire. From the report of the lead ACAV he believed that the fire was but a harassing tactic, or at the most that it came from only a platoon or a company of Viet Cong. In any case, with eighty vehicles to protect and only nine ACAV's to do the job, Keltner felt he had little choice.

Still on the move, he ordered his own crew to spray the banana trees south of the road with fire. Just as his machine guns opened up, a mortar round burst close behind his ACAV and immediately in front of the next-A34 but did no damage. While all the ACAV's of the first two groups poured machine gun fire into both sides of the road, nearly half of the convoy, including Keltner's own vehicle, passed safely through and beyond the killing zone. But the full force of the enemy's ambush still had not been brought to bear. Even though Keltner had received the warning too late to stop the column short of the killing zone, he had been able to alert his escorts almost at the exact moment the Viet Cong moved to spring their ambush. The Dong Nai Regiment had been denied the benefit of total surprise.

At Long Binh Lt. Col. Martin D. Howell, the squadron commander, heard Keltner report small arms fire. Like the lieutenant, he believed it to be harassing fire but nevertheless dispatched the remainder of Troop C to the scene. With Charley Troop roaring out of the staging area and the light fire team helicopters, alerted earlier, rushing to the scene, help was on the way even before the battle reached a peak.

Although most of the front half of the convoy had passed out of danger, eight trucks had fallen behind because the first of the eight was carrying a heavy load. As these last trucks and the section led by the next two ACAV's-C18 and C13-entered the killing zone, the ACAV's fired first into the edge of the jungle and, as they kept moving, into the banana grove. The Viet Cong answered with small arms and automatic weapons from both sides of the road. The exchange of fire at a range of less than twenty meters became a deafening roar. To many of the men in the following trucks, this fusillade was the first warning of an ambush, for vehicle noises had drowned out the earlier exchange. The trucks not yet under fire began to slow down, their drivers displaying the uncertainty they felt about what lay ahead.

Yet the convoy kept moving and the road ahead remained clear. The exchange of fire grew in volume as those trucks with "shotgun" riders began to engage the ambushers on the right (south) side of the road. The crash of exploding grenades added to the noise of battle. Then a round from a recoilless rifle struck C18 on the edge of the loading ramp but failed to stop the ACAV.



Map 5



BURNING TRUCK WITH TRAILER, OPPOSITE BANANA GROVE

As the firelight continued at close range, the trucks forming the rear of the column, not yet in the killing zone, began to pull over to the side of the road. Those immediately behind C18 and C13, already under fire, stopped and the men aboard raced for cover in ditches on either side of the road. The only vehicles moving at that point were the last eight trucks from the first half of the column and ACAV's C13 and C18.

Hardly had C18 escaped one round from a recoilless rifle when another burned a hole in its right side, starting a fire. This hit wounded the ACAV commander, but the crew continued to fire the .50-caliber machine gun and the M60's into the enemy position south of the road.

Now another recoilless rifle round struck the heavily loaded lead truck whose slowness had opened a gap in the truck column. The gasoline tank exploded, instantly killing the two men in the cab. The truck lurched to the left into the ditch on the north side of the road, its trailer still on the pavement, partially blocking the highway. A column of thick black smoke

shot into the morning sky. While the 52 crew of C18 continued to fire, the wounded commander radioed his situation to Keltner.

shot into the morning sky. While the 52 crew of C18 continued to fire, the wounded commander radioed his situation to Keltner.

After passing the word on to squadron headquarters, Lieutenant Keltner turned around to enter the fight again, but before he could return C18 burst into flames. On order of the critically wounded sergeant, all the crew except the driver evacuated the vehicle, dragging the sergeant out of the commander's hatch and carrying him into the high grass on the north side of the highway. Only light fire had come from that direction, and it seemed the safest place to go. The driver of the burning C18 finally got it started again and headed down the road through a hail of small arms and antitank rocket fire, hoping to distract the enemy's attention and allow the other crewmen to make good their escape. He succeeded, but four hundred meters down the road met his death when one of the thousands of small arms rounds fired at the moving ACAV found its mark.

Even as C18 fought to the death, the troopers in C13, a few meters farther forward along the road, moved to counter small arms fire and grenades raining on the three remaining trucks to their front. Racing forward, the driver interposed his ACAV between the trucks and heavy enemy fire coming from the banana grove on the right side of the road, but not before a recoilless rifle sent a second truck up in flames.

As C13 came abreast of the burning truck, another round exploded against its right gun shield, destroying the M60 machine gun, killing the gunner, and wounding everybody but the driver. A recoilless rifle round struck the engine compartment and C13 began to burn. Although the driver himself was now wounded, he continued to move forward, deeper into the killing zone. Veering past the truck trailer that partially blocked the road, he went fifteen hundred meters past the end of the ambush. Only then did the crew abandon the burning vehicle. Moments later C13 exploded.

After C13 had rolled down the highway spewing smoke, there was a sudden silence. For the first time the men who had taken cover in the ditches alongside the road could hear jet fighters circling overhead and hear as well as see a flight of helicopters turning to make firing runs. The silence on the ground lasted perhaps ten seconds before it was broken by the roar of another round from a recoilless rifle aimed at one of the trucks that the trailer of the lead truck had blocked. So close was the range that the crash of the impacting round mingled with the roar of the back blast. Then came another blast, and a third, and a fourth, as the Viet Cong gunners methodically destroyed two more trucks.

The men replied with fierce counterfire. Sharply conscious that no ACAV's remained in the killing zone to provide fire support, they fully expected the Viet Cong to emerge from their ambush and overrun the ditch. But the enemy was feeling the air attacks. The column of smoke from the burning trucks was a beacon upon which air support was converging.

A minute after the first truck was hit, the two forward air controllers attacked with the only weapons they had—white phosphorus marking rockets. Flying their slow observation craft through heavy small arms fire, they searched for the Viet Cong. Seeing puffs of smoke from weapons firing in the banana grove; Major Stefanelli placed his first rocket there. His ship hit by ground fire but still operational, Captain Smith aimed his rocket into the jungle opposite the burning trucks. As Stefanelli fired a second rocket into the banana trees,

Smith aimed his at a group of twenty Viet Cong who had risen and were running south. Even as the first trucks were hit and the first rockets struck, the ambush was breaking up.



AERIAL VIEW OF CONVOY AMBUSH AFTER FIRST AIR STRIKE

A minute after the first truck was hit, the two forward air controllers attacked with the only weapons they had—white phosphorus marking rockets. Flying their slow observation craft through heavy small arms fire, they searched for the Viet Cong. Seeing puffs of smoke from weapons firing in the banana grove; Major Stefanelli placed his first rocket there. His ship hit by ground fire but still operational, Captain Smith aimed his rocket into the jungle opposite the burning trucks. As Stefanelli fired a second rocket into the banana trees, Smith aimed his at a group of twenty Viet Cong who had risen and were running south. Even as the first trucks were hit and the first rockets struck, the ambush was breaking up.

When the two light aircraft pulled out of their diving attacks, the only Huey gunship operational with the 1st Squadron that day moved in. From having monitored the 1st Platoon's radio frequency, the pilot, Capt. Turner L. Nelson, knew almost as much about what was happening on the ground as did Lieutenant Keltner. He made two passes, firing machine guns and a total of eight rockets into the ambush positions. So heavy did the ground fire directed at the lone helicopter seem to the truckers in the ditches that few believed the ship could escape; somehow the helicopter emerged unscathed.

Close behind Captain Nelson's strikes came the regimental light fire team, alerted only minutes before. Diverted from an administrative mission in mid-flight, the team commander, Capt. George E. Kinback, approached the scene from the south. The second helicopter, piloted by Capt. Frank Y. Sasaki, had taken off from the Blackhorse helipad at the base camp and approached from the east. About three kilometers south of Highway 1, Kinback observed Sasaki's ship and directed him toward the column of smoke rising from the first of the stricken trucks.

As the two ships lined up for their first firing run, Kinback tried unsuccessfully to get instructions from Keltner by radio. Captain Nelson, circling north of the road, was unable to contact either Kinback or Sasaki. Yet lack of communications imposed little delay, for not only could Kinback and Sasaki spot the burning trucks, but heavy fire from the Viet Cong positions gave away the enemy's location.

On the first pass the two Hueys loosed machine gun fire and six pairs of rockets at the Viet Cong. On the second pass they had help from Captain Nelson, who was at last in communication with the team and fell in behind the regimental gunships.

On this run the three Hueys poured continuous machine gun fire and nine pairs of rockets into the enemy positions. On a third and then a fourth firing run they expended the remaining six pairs of rockets and continued to hit the foe with machine gun fire.

While the fourth helicopter firing run was in progress, the regimental operations center radioed an order for the team to move north of the road to make way for a strike by Air Force jets. The arrival of jets in a battle only eight minutes old brought pure joy to those men of the convoy who were still crouching in the ditches. Three F-100's now joined the fight. The men on the ground had no way of knowing—nor would they have really cared—that they got this support less by calculated design than by a lucky break. An air controller on a routine administrative flight had seen the smoke of the first burning truck. Knowing that a preplanned air strike for a nearby South Vietnamese Army division was minutes away, he called the Blackhorse operations center and offered to turn the fighters over to the 11th Cavalry. The Blackhorse air liaison officer on duty at the center, Air Force Maj. Charles F. Post, had jumped at this unexpected windfall and informed Major Stefanelli. But even before the radio alerted them, the jets were roaring over the ambush, guided by the column of smoke. Reaching the fighter pilots on a universal emergency frequency, Stefanelli turned them over to Captain Smith, who had just enough fuel left to put the strike in before heading for home base.

The air liaison officer at the Blackhorse operations center directed the aircraft to strike fifty meters inside the jungle, south of the highway. Smith added a 25-meter safety margin, rolled his aircraft over, dived, and fired one of his two remaining marking rockets. Plunging through intense fire from the enemy, the jets dropped six high-drag 500-pound bombs at the western edge of the ambush. Smith then marked for a napalm run, and the jets dropped six tanks on more enemy troops running south; they followed with a strafing run of 20-mm. cannon fire on Viet Cong fleeing along a trail in the jungle south of the road.

As the air strike took place, Lieutenant Keltner, on the ground, was directing the commander of his lead ACAV to take that part of the convoy that had escaped the ambush on to the base camp. He himself turned his vehicle along with C10 back toward the burning trucks. Coming first upon C13, burning on the road, Keltner directed C10 to remain with the wounded crewmen who had taken cover in the high grass on the north side of the road until a helicopter could arrive. Then C10 would rejoin Keltner.

Alone, Keltner's ACAV pressed on at top speed toward the burning trucks, the lieutenant in the process radioing for a medical evacuation helicopter for the wounded. A helicopter from the Blackhorse base camp, already overhead and monitoring Keltner's frequency, responded immediately. As Keltner's ACAV sped along the highway, ten Viet Cong suddenly darted across its path. Both the Viet Cong and the gunners in the ACAV opened fire. Five of the enemy fell; the others made it into the scrub jungle south of the road. Keltner's left machine gunner, hit in the head, died instantly.

During this brief engagement a 57-mm. recoilless rifle fired five rounds at the lieutenant's vehicle. Despite the speed of C16—thirty-five to forty-five miles an hour—the last round hit its left side. Although the antitank round failed to stop Keltner's ACAV, the lieutenant and his right machine gunner were wounded by fragments and the intercom and radios were knocked out, leaving Keltner only a portable radio lashed to the outside of the commander's hatch. Intended for maintaining contact with the air controller, this radio provided the only remaining link between Keltner and his platoon.

When he reached the abandoned and still-smoldering hulk of C18, Keltner could detect no sign of the crew. He stopped long enough to remove the vehicle's machine guns, then drove on till he reached the burning trucks. From the ditch along the south side of the road, the men from the trucks were still exchanging small arms fire with the Viet Cong. Five to six minutes had passed since C13 and C18 had been knocked out. Calling for a second medical helicopter for the wounded truck drivers, Keltner rode down the line of trucks to make certain he had missed no casualties. Finding none, he continued to the rear of the convoy, where he left his dead gunner and exchanged his ACAV for C23 which had an operable intercom and radios.

Mounted in C23 and accompanied by C16, Keltner returned to the burning trucks, his gunners firing from the moving vehicle into the jungle. When the men from the trucks told him that most of the enemy fire was now coming from the north, Keltner radioed for an air strike against the edge of the jungle lying north of the highway. This call coincided with the end of the strafing run by the F-100's, but in response to a request by the 1st Squadron operations center, initiated only minutes after the ambush was sprung, two F-5 Freedom Fighters had arrived over the ambush site. They swept in on the target, hitting the west edge of the patch of jungle with cluster bomb units that sounded like rolling thunder to the troops along the edge of the road.

Observing the strike while cruising along the road with his machine gunners firing into the jungle on either side, Keltner called in an adjustment to Colonel Howell, who had arrived overhead in a Huey, and on the second pass the aircraft dropped napalm tanks closer to the south edge of the jungle. This did the job; no further enemy fire came from the north. After another quick but unsuccessful search for the crew of C18, Keltner returned again to the burning trucks even as the first of the relief forces began to arrive.

When Colonel Howell had reacted to Lieutenant Keltner's first report of small arms fire by ordering Troop C to the scene, he had some qualms that he might be sending troops to deal with only a few snipers. But when Keltner's report of burning trucks came a few moments later, Howell ordered both Troop B and Company D (a tank company) to follow Troop C. As the squadron moved, Colonel Howell mounted his waiting helicopter. As soon as he gained altitude he could see the column of smoke from the trucks and the bombs of the air strike rising from the killing zone.

Guiding on the smoke, the colonel was soon over the ambush site, talking to Keltner, adjusting the second air strike, and formulating his battle plan. Troop C would go south of the highway and then east along the railroad tracks, cutting off the most obvious route of retreat, while Troop B would swing north in an arc connecting each end of the ambush. The tanks of Company D would push along the highway to force the enemy into the encircling troops.

As the relief force drew closer to the ambush, Colonel Howell and Lieutenant Keltner adjusted the second air strike to be brought against the enemy positions. Minutes later, Troop B swung north through the strike zone, Troop C turned south, and Company D's tanks swept into the grass north of the highway. It was 1100, only thirty-five minutes since the ambush had struck, and the squadron already had traveled over twenty kilometers.

While the squadron maneuvered, Keltner searched again for C18's missing crew. This time he found the men in the grass north of the road protecting their critically wounded commander. Within a few minutes a helicopter had evacuated them.

Twenty minutes after the relief force arrived, the southern pincer made contact with the enemy as 1st Lt. James V.

what proved to be the rear guard of the 274th Regiment, fleeing south across the railroad tracks. Stewart's crew killed two Viet Cong and captured a Chinese-made 57-mm. recoilless rifle. For the rest of the day the tanks and ACAV's continued closing the circle around the ambush site. Cruising through the grass adjacent to the highway, Company D flushed out and killed, one at a time, five Viet Cong. Troop A, released from the base camp, joined the squadron and killed one enemy soldier, and Troop B captured another. By 1600 it became clear that, even with the help of a South Vietnamese infantry battalion that made a cursory search of the area, the squadron had failed to trap the main force of the enemy.

Colonel Howell then directed the squadron to coil around the ambush site for the night.

After encountering a few enemy patrols that night, the squadron searched the battlefield the next day and for two days following. The men found bunkers along the escape route and a total of thirty enemy dead. The convoy and its escort had lost seven men killed and eight wounded, four trucks and two ACAV's destroyed.

Next Regular Meeting

The next meeting will be on **Thursday, January 26th, 2016**, at 7:00PM. We meet in the Fellowship Hall of Redemption Lutheran Church, 4057 N Mayfair Road. Use the south entrance. Access the MRAC Yahoo group for important details about the February Meeting.

Meeting Schedule:

February 23rd, 7 pm

Please do not call the church for information!

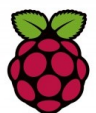
Club Nets

Please check in to our nets on Friday evenings.

Our ten meter SSB net is at **8:00 p.m. at 28.490 MHz USB** Our two meter FM net follows at **9:00 p.m.** on our repeater at **145.390 MHz** with a minus offset and a **PL of 127.3 Hz**.

Visit our website at: www.w9rh.org

Or phone (414)-459-9741



VE Testing:

January 28th, 9:30am— 11:30am

No testing: June, August or December

ALL testing takes place at: Ham Radio Outlet 5720 W. Good Hope Rd. Milwaukee, WI 53223

Area Swapfests

**March 11th [Amateur Equipment Auction](#) Location: Eau Claire, WI Type: ARRL Hamfest
Sponsor: Eau Claire Amateur Radio Club
Website: <http://www.ecarc.org>**

**Sunday, March 19th, [Hamfest 2017](#) Location: Jefferson, WI Type: ARRL Hamfest
Sponsor: Tri County Amateur Radio Club - W9MQB
Website: <http://www.w9mqb.org>**

MRAC Working Committees 100th Anniversary:

- Dave—KA9WXN

Net Committee:

- Open

Field Day

Dave—KA9WXN, Al—KC9IJJ

FM Simplex Contest

- Joe – N9UX
- Jeff – K9VS

Raffle

- Tom – N9UFJ

Newsletter Editor

- Michael-KC9CMT
- Pancho- KA9OFA

Webmaster

- Dave, KA9WXN

Refreshments

- Open



Welcome

Membership Information

The Hamateur Chatter is the newsletter of MRAC (Milwaukee Radio Amateurs' Club), a not for profit organization for the advancement of amateur radio and the maintenance of fraternalism and a high standard of conduct. MRAC Membership dues are \$17.00 per year and run on a calendar year starting January 1st. MRAC general membership meetings are normally held at 7:00PM the last Thursday of the month except for November when Thanksgiving falls on the last Thursday when the meeting moves forward 1 week to the 3rd Thursday and December, when the Christmas dinner takes the place of a regular meeting. Club Contact Information

Our website address <http://www.w9rh.org>

Telephone **(414)-459-9741**

Address correspondence to:

MRAC, PO Box 26233, Milwaukee, WI 53226-0233



Email may be sent to: w9rh@arrl.net . Our YAHOO newsgroup:

<http://groups.yahoo.com/group/MRAC-W9RH/>

CLUB NETS:

- The Six Meter SSB net is Thursday at 8:00PM on 50.160 MHz USB
- Our Ten Meter SSB net is Friday at 8:00PM on 28.490 MHz \pm 5 KHz USB.
- Our Two Meter FM net follows the Ten meter net at 9:00PM on our repeater at 145.390MHz - offset (PL 127.3)

Chatter Deadline

The **DEADLINE** for items to be published in the **Chatter** is the **15th of each month**. If you have anything (announcements, stories, articles, photos, projects) for the 'Chatter, please get it to me before then.

You may contact me or Submit articles and materials by e-mail at: W9rhmrac@Gmail.com

or by Post to:

Michael B. Harris

807 Nicholson RD

South Milwaukee, WI 53172-1447

Milwaukee Area Nets

Mon.8:00 PM 3.994 Tech Net

Mon.8:00 PM 146.865- ARRL Newsline

Mon.8:00 PM 146.445+ Emergency Net

Mon.8:00 PM 146.865- Walworth County ARES net

Mon. 8:00 PM 442.100+ Railroad net, also on EchoLink

Mon. 8:45 PM 147.165- ARRL Audio News

Mon. 8:00 PM 442.875+ WIARC net also on EchoLink 576754

Mon. 8:30 PM 146.820 Waukesha ARES Net —

on the 1st, 3rd, and 5th Monday of each month.

Mon. 9:00 PM 147.165– Milwaukee County ARES Net

Saturday Night Yaesu Fusion Net 7:00 P.M., W9RH Repeater, C4FM digital mode, using "DN", digital narrow mode

Tue. 9:00 AM 50.160 6 Mtr 2nd Shifter's Net

Tue. 9:00 PM 145.130+ MAARS Hand Shakers Net

Tue. 8:00 PM 7.035 A.F.A.R. (CW)

Wed. 8:00 PM 145.130+MAARS Amateur Radio Newsline

Wed. 8:00 PM 147.045+ West Allis ARC net

Wed. 8:00 PM 28.365Mhz 10/10 International Net

Daily: Milwaukee — Rag Chew Net: 7:00 AM, 3850 SSB + Florida Net 7 am, 14.290 mhz.

2 meter repeaters are offset by 600KHz - 70 centimeter repeaters are offset by 5 MHz

SSB frequencies below 20 meters are LSB and for 20 Mtr and above are USB.

Wed. 8:00 PM 147.270+ Racine County ARES net

Wed. 9:00 PM 145.130+MAARS SwapNet, Allstar FM-38

Thur. 8:00 PM 50.160, 6 Mtr SSB Net

Thur. 8:00 PM 443.800+ Tech Net

Thur. 9:00 PM 146.910+ Computer Net

Fri. 8:00 PM 28.490 MRAC W9RH 10 Mtr SSB Net

Fri. 9:00 PM 145.390+ W9RH 2 MTR. FM Net

Sat. 7:30 AM MW Classic Radio Net , Freq.—3885 AM

Sat. 8:00 PM 146.910+ YL's Pink HAMsters Net

Sat. 9:00 PM 146.910+ Saturday Night Fun Net

Sun 8:00 AM, State ARES Net 3967/3977.5/145.470

Sun 8:30 AM 3.985 QCWA (Chapter 55) SSB net

Sun 9:00 AM 145.565+ X-Country Simplex Group

Sun 8:00 PM 146.910+ Information Net

Sun 8:00 PM 28.365 10/10 International Net (SSB)

Sun 9:00 PM 146.910+ Swap Net

Minnesota/Wisconsin Yaesu System Fusion, Wires-X Technical Net.

Monday Evenings 7:30 P.M. Local Time.

Sponsored By

BARS -Bakken Amateur Radio Society.

**Where: On the MRAC repeater,
145.390MHz, Offset -600KHz, PL Tone encode of 127.3.**

The Net is carried via a RF Node Link to Wires-X Room (21493) .

The net is held in the Digital Narrow (DN) mode.